

Early Detection of Chronic Obstructive Respiratory Disease

CHRONIC OBSTRUCTIVE RESPIRATORY DISEASE is one of the major and most rapidly increasing causes of disability in the United States. By the time dyspnea or reduction in spirographic forced expired volume in one second (FEV_1) develops, the disease has reached an irreversible stage. Diagnosis in the early stages is essential if medical management is to succeed in preventing progressive involvement and associated disability.

Over the past few years, a number of tests have been described which are capable of detecting chronic obstructive respiratory disease at a time when results of less sensitive tests, such as the FEV_1 , are normal and the pathological condition is largely confined to the small airways (less than 2 to 3 mm in diameter). These tests include (1) frequency dependence of compliance, (2) forced expiratory flow rates calculated from the middle or terminal portion of the conventional spirogram or flow-volume curve, (3) closing volume and closing capacity (the volume at which airways in dependent lung zones begin to close) and (4) volume of isoflow calculated from maximal expiratory flow-volume curves determined with the patient breathing air and a mixture of 80 percent helium and 20 percent oxygen. Although "frequency dependence of compliance" may be the most sensitive of these tests, it is too invasive and complex for routine use. Of the other tests, the spirographic maximum midexpiratory flow rate is the simplest and the best standardized.

Recently, in more than 200 subjects, radioxenon and radioaerosol inhalation lung imaging was compared with multiple pulmonary function tests and other diagnostic procedures to determine their relative sensitivity in detecting evidence of early obstructive airway disease. Subjects were classified by the presence or absence of chronic obstructive respiratory disease by two chest physicians on the basis of all available data except the radionuclide studies. The radioaerosol procedure showed the greatest sensitivity (84 percent) in the detection of the disease but its specificity was only fair (62 percent) in comparison with flow rates at mid- and low-lung volumes which showed both good sensitivity (74 percent) and specificity (84 percent).

At present it is not possible to predict which person with isolated abnormalities on the newer screening tests for small airways dysfunction will

progress to an irreversible and disabling stage of chronic obstructive respiratory disease. Longitudinal epidemiological studies of cohorts carefully defined from the clinical, environmental and physiological standpoint might answer this question. Indices of early obstructive airway disease in cigarette smokers have been found to be reversible following cessation of smoking; this observation may be of value in attempting to persuade some smokers to stop smoking.

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REFERENCES

- Hogg JC, Macklem PT, Thurlbeck WM: Site and nature of airway obstruction in chronic obstructive lung disease. *N Engl J Med* 278:1355-1360, Jun 20, 1968
- Macklem PT: Obstruction in small airways—A challenge to medicine. *Am J Med* 52:721-724, Jun 1972
- Ramana L, Tashkin DP, Taplin GV, et al: Radioaerosol lung imaging in chronic obstructive pulmonary disease. *Chest* 68:634-640, Nov 1975

Transbronchial Lung Biopsy Using a Flexible Fiberoptic Bronchoscope

THE ABILITY to obtain lung tissue without the risks and trauma of thoractomy has been enhanced by the technique of transbronchial biopsy through a flexible fiberoptic bronchoscope. This procedure was originally described using a rigid bronchoscope but now has been adapted to flexible bronchoscopes.

The technique is especially useful in obtaining lung tissue in such disorders as sarcoidosis, interstitial pneumonitis, alveolar cell carcinoma, lymphangitic spread of carcinoma and pulmonary alveolar proteinosis. Proper patient preparation is helpful for optimal collection of specimens. Good suppression of the cough with lidocaine and selection of an involved segment for biopsy, as determined by x-ray studies, are important. The tip of the bronchoscope is passed visually as far as possible. Then biopsy forceps, with jaws closed, are passed peripherally to the pleura under direct fluoroscopic control. They then are withdrawn 2 to 3 cm, opened and advanced until resistance is met. If no unusual chest wall sensations are felt by the patient, he is asked to slowly exhale. At the end of the exhalation, the jaws of the forceps are closed and the forceps removed. Usually a small piece of lung parenchyma and the neighboring bronchus are obtained. Since the specimens are small (1 to 2 mm in diameter), it is best to take